We claim:

1. A computer-readable medium having a data structure stored thereon to represent extended color gamut information for a pixel comprising:

a plurality of data fields, each data field to store a plurality of bits representing a different color component of the pixel; and,

at least one interpretation bit for each data field to indicate how the plurality of bits of the data field are to be interpreted in representing the different color component of the pixel.

2. The medium of claim 1, wherein the plurality of data fields comprises a red data field to store a plurality of bits representing a red color component of the pixel, a green data field to store a plurality of bits representing a green color component of the pixel, and a blue data field to store a plurality of bits representing a blue color component of the pixel.

3. The medium of claim 1, wherein the at least one interpretation bit for each data field of at least one of the plurality of data fields comprises a single bit and the number of the plurality of bits of the data field is n, the plurality of bits of the data field representing a value for the different color component of the pixel within a first range from 0 to $(2^n - 1)$ in increments of one where the single bit has a first value.

4. The medium of claim 3, wherein the plurality of bits of the data field represent a value for the different color component of the pixel within a second range from 2^n to $(2 \times 2^n) - 1$ in increments of one where the single bit has a second value.

5. The medium of claim 3, wherein the plurality of bits of the data field represent a value for the different color component of the pixel within a second range from -2^n to -1 in increments of one where the single bit has a second value.

6. The medium of claim 3, wherein the plurality of bits of the data field represent a value for the different color component of the pixel within a second range from 0.5 to $(2^n - 0.5)$ in increments of one where the single bit has a second value.

7. The medium of claim 3, wherein the least significant (n-1) bits of the plurality of bits of the data field represent a value for the different color component of the pixel within a second range from -2^{n-1} to -1 in increments of one where the single bit has a second value and where the most significant bit of the plurality of bits has a first value, and represent a value for the different color component of the pixel within a third range from 2^n to $(2^n + 2^{n-1}) - 1$ in increments of one wherein the single bit has the second value and where the most significant bit of the plurality of bits has a second value.

8. The medium of claim 3, wherein n = 8.

9. The medium of claim 1, wherein the at least one interpretation bit for each data field of at least one of the plurality of data fields comprises a pair of bits and the number of the plurality of bits of the data field is n, the plurality of bits of the data field representing a value for the different color component of the pixel within a first range from 0 to $(2^n - 1)$ in increments of one where the pair of bits has a first pair of values.

10. The medium of claim 9, wherein the plurality of bits of the data field represent a value for the different color component of the pixel within a second range from 2^n to $(2 \times 2^n) - 1$ in increments of one where the pair of bits has a second pair of values.

11. The medium of claim 10, wherein the plurality of bits of the data field represent a value for the different color component of the pixel within a third range from -2^n to -1 in increments of one where the pair of bits has a third pair of values.

12. The medium of claim 9, wherein the plurality of bits of the data field represent a value for the different color component of the pixel within a second range from 0.5 to (2^n – 0.5) in increments of one where the pair of bits has a second pair of values.

13. The medium of claim 12, wherein the plurality of bits of the data field represent a value for the different color component of the pixel within a third range from 2^n to (2^n + 2^{n-1}) – 0.5 in increments of 0.5 where the pair of bits has a third pair of values.

14. The medium of claim 13, wherein the plurality of bits of the data field represent a value for the different color component of the pixel within a fourth range from -2^{n-1} to -0.5 in increments of 0.5 where the pair of bits has a fourth pair of values.

15. The medium of claim 9, wherein n = 8.

16. A computer-readable medium having a data file stored thereon representing image data having extended color gamut information and comprising a plurality of pixels, each pixel comprising:

a plurality of values corresponding to a plurality of color components of a color space, each value having a plurality of bits; and,

at least one interpretation bit for each color component of the plurality of color components to indicate how the plurality of bits of the value of the color component are to be interpreted in representing the color component.

17. The medium of claim 16, wherein the color space is a red-green-blue (RGB) color space, the plurality of color components of the color space comprising a red color component, a green color component, and a blue color component.

18. The medium of claim 16, wherein the at least one interpretation bit for each color component of at least one of the plurality of color components comprises a single bit and the number of the plurality of bits of the value of the color component is n, the value of the color component of the pixel being within a first range from 0 to $(2^n - 1)$ in increments of one where the single bit has a first value.

19. The medium of claim 18, wherein the value of the color component of the pixel is within a second range from 2^n to $(2 \times 2^n) - 1$ in increments of one where the single bit has a second value.

20. The medium of claim 18, wherein the value of the color component of the pixel is within a second range from -2^n to -1 in increments of one where the single bit has a second value.

21. The medium of claim 18, wherein the value of the color component of the pixel is within a second range from 0.5 to $(2^n - 0.5)$ in increments of one where the single bit has a second value.

22. The medium of claim 18, wherein the value of the color component of the pixel is within a second range from -2^{n-1} to -1 in increments of one where the single bit has a second value and where the most significant bit of the plurality of bits has a first value, and is within a third range from 2^n to $(2^n + 2^{n-1}) - 1$ in increments of one wherein the single bit has the second value and where the most significant bit of the plurality of bits has a second value.

23. The medium of claim 16, wherein the at least one interpretation bit for each color component of at least one of the plurality of color components comprises a pair of bits and the number of the plurality of bits of the value of the color component is n, the value of the color component of the pixel being within a first range from 0 to $(2^n - 1)$ in increments of one where the pair of bits has a first pair of values.

24. The medium of claim 23, wherein value of the color component of the pixel is within a second range from 2^n to $(2 \times 2^n) - 1$ in increments of one where the pair of bits has a second pair of values, and is within a third range from -2^n to -1 in increments of one where the pair of bits has a third pair of values.

25. The medium of claim 23, wherein value of the color component of the pixel is within a second range from 0.5 to $(2^n - 0.5)$ in increments of one where the pair of bits has a second pair of values, is within a third range from 2^n to $(2^n + 2^{n-1}) - 0.5$ in increments of 0.5 where the pair of bits has a third pair of values, and is within a fourth range from -2^{n-1} to -0.5 in increments of 0.5 where the pair of bits has a fourth pair of values.

26. The medium of claim 16, wherein the data file is a Joint Photographic Experts Group (JPEG) file, the at least one interpretation bit for each color component of the plurality of color components of each pixel stored as tag data of the JPEG file.

27. The medium of claim 16, wherein the data file is a Tagged Image File Format (TIFF) file, the at least one interpretation bit for each color component of the plurality of color components of each pixel stored as alpha channel data of the TIFF file.

28. A method for displaying image data having a plurality of pixels, each pixel having a plurality of values corresponding to a plurality of color components of a color space, each value having a plurality of bits numbering n, the method comprising for each color component and for each pixel:

where an interpretation bit for the value of the pixel for the color component is a first value, displaying the color component for the pixel as the value of the pixel for the color component; and,

where the interpretation bit for the value of the pixel for the color component is a second value, displaying the color component for the pixel as one of:

2^n plus the value of the pixel for the color component;

-2^n plus the value of the pixel for the color component;

0.5 plus the value of the pixel for the color component;

where the most significant bit of the plurality of bits of the value of the pixel for the color component is a first value, -2^{n-1} plus a value equal to the least significant (n-1) bits of the plurality of bits of the value of the pixel for the color component; and,

where the most significant bit of the plurality of bits of the value of the pixel for the color component is a second value, 2^n plus a value equal to the least significant (n-1) bits of the plurality of bits of the value of the pixel for the color component.

29. The method of claim 28, wherein the color space is a red-green-blue (RGB) color space, the plurality of color components of the color space comprising a red color component, a green color component, and a blue color component.

30. The method of claim 28, wherein n = 8.

31. The method of claim 28, wherein displaying the image data comprises forming an image on media.

32. A method for displaying image data having a plurality of pixels, each pixel having a plurality of values corresponding to a plurality of color components of a color space, each value having a plurality of bits numbering n, the method comprising for each color component and for each pixel, where the value of the pixel for the color component has a pair of interpretation bits,

where the pair of interpretation bits for the value of the pixel for the color component has a first pair of values, displaying the color component for the pixel as the value of the pixel for the color component;

where the pair of interpretation bits for the value of the pixel for the color component has a second pair of values, displaying the color component for the pixel as 2^n plus the value of the pixel for the color component; and,

where the pair of interpretation bits for the value of the pixel for the color

component has a third pair of values, displaying the color component for the pixel as -2^n plus the value of the pixel for the color component.

33. The method of claim 32, wherein the color space is a red-green-blue (RGB) color space, the plurality of color components of the color space comprising a red color component, a green color component, and a blue color component.

34. The method of claim 32, wherein displaying the image data comprises forming an image on media.

35. A method for displaying image data having a plurality of pixels, each pixel having a plurality of values corresponding to a plurality of color components of a color space, each value having a plurality of bits numbering n, the method comprising for each color component and for each pixel, where the value of the pixel for the color component has a pair of interpretation bits,

where the pair of interpretation bits for the value of the pixel for the color component has a first pair of values, displaying the color component for the pixel as the value of the pixel for the color component;

where the pair of interpretation bits for the value of the pixel for the color component has a second pair of values, displaying the color component for the pixel as 0.5 plus the value of the pixel for the color component;

where the pair of interpretation bits for the value of the pixel for the color component has a third pair of values, displaying the color component for the pixel as 2^n plus (the value of the pixel for the color component divided by 2); and,

where the pair of interpretation bits for the value of the pixel for the color component has a fourth pair of values, displaying the color component for the pixel as -2^{n-1} plus (the value of the pixel for the color component divided by 2).

36. The method of claim 35, wherein the color space is a red-green-blue (RGB) color space, the plurality of color components of the color space comprising a red color component, a green color component, and a blue color component.

37. The method of claim 35, wherein displaying the image data comprises forming an image on media.

38. A method for encoding an original color component value for a pixel having more than 2^n possible values into a new color component value for the pixel having a plurality of bits numbering n and an interpretation bit, the method comprising:

where the original color component value is between 0 and $2^n - 1$ and is an integer, setting the new color component value equal to the original color component value, and setting the interpretation bit to a first value.

39. The method of claim 38, further comprising, where the original color component value is between 2^n and $(2 \times 2^n) - 1$, setting the new color component value equal to the original color component value minus 2^n, and setting the interpretation bit to a second value.

40. The method of claim 38, further comprising, where the original color component value is between -2^n and -1, setting the new color component value equal to the original color component value plus 2^n, and setting the interpretation bit to a second value.

41. The method of claim 38, further comprising, where the original color component value is between 0.5 and $(2^n - 0.5)$ and a non-integer, setting the new color component value equal to the original color component value minus 0.5, and setting the interpretation bit to a second value.

42. The method of claim 38, further comprising:

where the original color component value is between -2^{n-1} and -1, setting the least significant (n-1) bits of the new color component value equal to the original color component value plus 2^{n-1}, setting the most significant bit of the new color component value equal to a first value, and setting the interpretation bit to a

second value; and,

where the original color component value is between 2^n and $(2^n + 2^{n-1})-1$, setting the least significant (n-1) bits of the new color component value equal to the original color component value minus 2^n, setting the most significant bit of the new color component value equal to a second value, and setting the interpretation bit to the second value.

43. The method of claim 38, wherein n = 8.

44. A method for encoding an original color component value for a pixel having more than 2^n possible values into a new color component value for the pixel having a plurality of bits numbering n and a pair of interpretation bits, the method comprising:

where the original color component value is between 0 and $2^n - 1$ and is an integer, setting the new color component value equal to the original color component value, and setting the pair of interpretation bits to a first pair of values.

45. The method of claim 44, further comprising:

where the original color component value is between 2^n and $(2 \times 2^n) - 1$, setting the new color component value equal to the original color component value minus 2^n, and setting the pair of interpretation bits to a second pair of values; and,

where the original color component value is between -2^n and -1, setting the new color component value equal to the original color component value plus 2^n, and setting the pair of interpretation bits to a third pair of values.

46. The method of claim 44, further comprising:

where the original color component value is between 0.5 and $(2^n - 0.5)$ and is a non-integer, setting the new color component value to the original color component value minus 0.5, and setting the pair of interpretation bits to a second pair of values;

where the original color component value is between 2^n and $(2^n + 2^{n-1}) - 0.5$,

setting the new color component value to (the original color component value minus 2^n) and multiplied by two, and setting the pair of interpretation bits to a third pair of values; and,

where the original color component value is between -2^{n-1} and -0.5, setting the new color component value to (the original color component value plus 2^{n-1}) and multiplied by two, and setting the pair of interpretation bits to a fourth pair of values.

47. The method of claim 44, wherein n = 8.

48. A system comprising:

a processor;

a computer-readable medium having image data stored thereon having a plurality of pixels, each pixel having a plurality of values corresponding to a plurality of color components of a color space, the value of the pixel for each color component having at least one interpretation bit; and,

a computer program executed by the processor to display each color component for each pixel based on a value of the at least one interpretation bit for the value of the color component for the pixel.

49. The system of claim 48, wherein the color space is a red-green-blue (RGB) color space, the plurality of color components of the color space comprising a red color component, a green color component, and a blue color component.

50. The system of claim 49, wherein the value of each pixel for each color component comprises 8 bits, the values of the pixel for two of the red, green, and blue color components each having a pair of interpretation bits, and the value of the pixel for the other of the red, green, and blue color components having a single interpretation bit.

51. The system of claim 48, wherein the computer program is executed from the computer-readable medium on which the image data is stored.

52. The system of claim 48, wherein the computer program is executed from a different computer-readable medium than the computer-readable medium on which the image data is stored.

53. The system of claim 48, further comprising a display on which the computer program displays each color component for each pixel.

54. A system comprising:

a computer-readable medium having image data stored thereon having a plurality of pixels, each pixel having a plurality of values corresponding to a plurality of color components of a color space, the value of the pixel for each color component having at least one interpretation bit; and,

means for displaying each color component for each pixel based on a value of the at least one interpretation bit for the value of the color component for the pixel.

55. The system of claim 54, wherein the color space is a red-green-blue (RGB) color space, the plurality of color components of the color space comprising a red color component, a green color component, and a blue color component, and wherein the value of each pixel for each color component comprises 8 bits, the values of the pixel for two of the red, green, and blue color components each having a pair of interpretation bits, and the value of the pixel for the other of the red, green, and blue color components having a single interpretation bit.

56. A system comprising:

a processor;

a computer-readable medium having original image data stored thereon having a plurality of pixels, each pixel having a plurality of values corresponding

to a plurality of color components of a color space, each color component having more than 2^{n+k} possible values;

a computer program executed by the processor to convert the value of each color component for each pixel of the original image data to a new value of the color component for a corresponding pixel of new image data having a plurality of bits numbering n and at least one interpretation bit numbering k to interpret the new value of the color component for the corresponding pixel of the new image data.

57. The system of claim 56, wherein the color space is a red-green-blue (RGB) color space, the plurality of color components of the color space comprising a red color component, a green color component, and a blue color component.

58. The system of claim 57, wherein the new value of each pixel of the new image data for each color component comprises 8 bits, the new values of the pixel for the red, green, and blue color components each having a pair of interpretation bits.

59. A system comprising:

a computer-readable medium having original image data stored thereon having a plurality of pixels, each pixel having a plurality of values corresponding to a plurality of color components of a color space, each color component having more than 2^{n+k} possible values;

means for converting the value of each color component for each pixel of the original image data to a new value of the color component for a corresponding pixel of new image data having a plurality of bits numbering n and at least one interpretation bit numbering k to interpret the new value of the color component for the corresponding pixel of the new image data.

60. The system of claim 59, wherein the color space is a red-green-blue (RGB) color space, the plurality of color components of the color space comprising a red color component, a green color component, and a blue color component, and

wherein the new value of each pixel of the new image data for each color component comprises 8 bits, the new values of the pixel for the red, green, and blue color components each having a pair of interpretation bits.